PUBLICATIONS OF
THE DAVID DUNLAP OBSERVATORY
UNIVERSITY OF TORONTO

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AN ATLAS OF OPEN CLUSTER COLOUR-MAGNITUDE DIAGRAMS

GRETCHEN L. HAGEN

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Introduction

Almost twenty years ago Johnson and Morgan (1951) first used their *UBV* system to study the colour-magnitude diagram of the Pleiades cluster. Subsequently they were able to show that observations on the *UBV* system could be used to derive both the distance and the reddening of a cluster (Johnson and Morgan 1953). Since then almost 200 galactic open clusters have been studied on the *UBV* system. The observations are now widely dispersed throughout the literature. It is the purpose of this *Atlas* to draw these observations together by presenting cluster colour-magnitude diagrams in a uniform format.

The general procedure followed was to search the literature for all relevant information on each cluster. Data in the form of photometry, radial velocity measures, proper motions, and spectral classifications were assembled. When more than one source of information was available in any of these areas the data were compared and generally combined. In many cases, particularly for proper motions, it was necessary to cross-correlate data from six or more different studies and often the notation and star designations had very little in common. It should be stressed that every effort was made to maintain consistency of procedure throughout the project.

Whenever possible, the proper motion and radial velocity data were used to reduce the contamination of a cluster colour-magnitude diagram by field stars. Stars were generally considered to be probable members if their proper motions did not differ from the centroid of the cluster motion by more than $2\sqrt{2}$ times the standard error of measurement. In a number of cases the contrast between cluster and field stars could be and was enhanced by making use of stars near the cluster centre only. Known binary stars were excluded. It should be emphasized that no stars were ever rejected on the basis of photometric data alone.

Only clusters for which observations of individual stars have been published were included here. The two exceptions to this rule are the important old clusters NGC 2477 (Eggen and Stoy 1961) and Mel 66 (Eggen and Stoy 1962). Clusters in which magnitudes were based on photographic transfers have not, in general, been included but an exception was made when a cluster and a photoelectric sequence occurred on different parts of the *same* Schmidt plate.

Description of the Atlas

Only photoelectric (or photoelectrically calibrated photographic) observations on the *UBV* and U_cBV (Cousins, Eggen, and Stoy 1961) systems were included in the present *Atlas*. When two or more sources of photometric observations were available the data were combined with equal weight. (A few exceptions to this procedure are noted in the Remarks on the Clusters).

Unless otherwise noted individual cluster distances and reddening values were taken directly from the source of photometric data. For clusters studied in more than one paper the mean distance modulus and the mean reddening were usually adopted. No corrections were made for differential reddening. In all cases it was assumed that the apparent visual distance modulus $(m-M)_V$, the true distance modulus $(m-M)_0$ and the reddening E_{B-V} were related by

$$(m-M)_0 = (m-M)_V - 3.0\, E_{B-V} \qquad (1)$$

References to the cluster literature were taken from the *Astronomischer Jahresbericht*, the Czechoslovak Cluster Catalogue (Alter, Ruprecht, and Vanýsek 1958) and its supplements, and from a card file maintained at the David Dunlap Observatory by Prof. Helen Sawyer Hogg. It is hoped that the literature search is complete for all material received at this observatory prior to July 1, 1969.

Data for the 189 clusters contained in the present *Atlas* are given in Table 1. The Remarks contain specific information relating to the individual clusters and their colour-magnitude diagrams. The colour-magnitude diagram for each cluster is printed on a separate card. All colour-magnitude diagrams have the same scale and a transparent reseau is provided to facilitate intercomparison. If the name of a cluster is followed by "pe", this indicates that all plotted points are based on photoelectric observations; otherwise photoelectrically calibrated photographic observations are plotted. Known variable stars are plotted as crosses.

Stellar associations have not been included in the *Atlas*. A few clusterings that did not appear to constitute physically real clusters were also omitted. These are An(vdB – CV Mon) (Arp 1960), Hogg 18 (Hogg 1961), Lyngå 3 and Lyngå 7 (Lyngå 1964), NGC 1807 (Purgathofer 1964), NGC 6167 (Whiteoak 1963) and NGC 7686 (Hoag *et al.* 1961).

Acknowledgements

I would like to thank Dr. Sidney van den Bergh for providing the original idea and the impetus, and for extensive discussion relating to this *Atlas*. It is also a pleasure to thank Prof. Helen Sawyer Hogg and to acknowledge the support of Dr. Donald A. MacRae, Director of the David Dunlap Observatory.

Mrs. Jean Lehmann was extremely cooperative in providing assistance in making use of the excellent library facilities at the David Dunlap Observatory. Thanks are also due to the Kitt Peak National Observatory for making its library available to me during two extended visits. Much valuable assistance was provided through countless discussions with astronomers here and at other observatories. Miss Roslyn Shemilt, Miss Eleanor Parmenter, Mr. David Lindop, and Mr. Scott Chen helped in the preparation of the diagrams. Most of the final drawings were done by Mrs. Ruth Coombes.

It is a privilege to express my profound gratitude to both colleagues and friends for their incalculable personal aid and understanding without which this work could never have been completed.

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TABLE I

Data for Clusters in Atlas

EXPLANATION OF TABLE I

Column 1 gives the cluster designation, i.e. its name and (or) number.

Column 2 gives the right ascension and declination for 1900 according to Alter *et al.* (1958). The clusters are listed in order of increasing right ascension and in the few cases in which this co-ordinate is the same for two clusters the order is that of the NGC number.

Column 3 gives the galactic longitude l^{II} and latitude b^{II}, from Alter *et al.* (1958).

Column 4 gives the distance in parsecs as calculated from the tabulated distance modulus. If $0 < r < 500$ the value given is to the nearest 10 pc, if $500 \leq r < 1000$ it is to the nearest 50 pc, and if $r \geq 1000$ the distance is stated to the nearest 100 pc.

Column 5 gives the true distance modulus, $(m-M)_0$, corrected for interstellar absorption, $A_V = 3\, E_{B-V}$. The distance modulus is taken from the source of photometric data. Average values were used if more than one source was available. $(m-M)_0$ is quoted to the nearest tenth of a magnitude.

Column 6 gives the sources used for the determination of $(m-M)_0$. The numbers in this and other source columns refer to the references.

Column 7 gives the reddening, E_{B-V}, determined from the photometry and quoted to the nearest hundredth of a magnitude. An asterisk means that variable reddening across the cluster is either suspected or confirmed.

Column 8 gives the sources for E_{B-V}.

Column 9 gives the type of photometry by which the cluster was studied, either photoelectric alone or photoelectric and photographic. The notation $U_C BV$ in this column indicates that the results are on the Cape photometric system. BV means that no U values were observed either photographically or photoelectrically.

Column 10 gives the limiting magnitude in B and V for the photoelectric sequence used to calibrate the observations.

Column 11 gives sources for proper motions that were used to eliminate non-members from the colour-magnitude diagram.

Column 12 gives the mean radial velocity for the cluster as determined by one or more authors.

Column 13 gives the sources of the radial velocity data.

Column 14 Only cluster members within the radius listed in this column were plotted in the cluster colour-magnitude diagrams. No entry is made in this column if all the observed stars were plotted.

TABLE I.

(1) Cluster	(2) $\alpha_{1900}/\delta_{1900}$	(3) l^{II}/b^{II}	(4) r(pc)	(5) $(m-M)_o$	(6) Source	(7) E_{B-V}
NGC 129	$0^h\ 24^m.3$ +59° 40′	120°.3 −02 .6	1700	$11^m.1$	13,98,132	$0^m.57$*
NGC 188	0^h 35 . 1 +84° 47	122 .8 +22 .5	1600	11 . 0	231	0 . 05
NGC 225	0^h 37 . 6 +61° 14	122 .0 −01 .1	650	9 . 0	132	0 . 29
NGC 457	1^h 12 . 8 +57° 48	126 .6 −04 .4	2900	12 . 3	132,210	0 . 48
NGC 559	1^h 22 . 8 +62° 47	127.2 +00 .7	1300	10 . 6	169	0 . 45
NGC 581 M 103	1^h 26 . 6 +60° 11	128 .0 −01 .8	2500	12 . 0	132,187 216	0 . 39*
Tr 1	1^h 29 . 0 +60° 46	128 .2 −01 .1	2500	12 . 0	187	0 . 58
NGC 654	1^h 37 . 2 +61° 23	129 .1 −00 .4	2900	12 . 3	132,212	0 . 93*
NGC 659	1^h 37 . 4 +60° 12′	129 .3 −01 .5	2300	11 . 8	187	0 . 58
NGC 663	1^h 39 . 2 +60° 44	129 .5 −01 .0	2100	11 . 6	132,187	0 . 83*
NGC 744	1^h 51 . 8 +54° 59	132 .4 −06 .2	1400	10 . 8	132	0 . 41
NGC 752	1^h 51 . 8 +37° 11	137 .2 −23 .4	360	7 . 8	63	0 . 03

DATA FOR CLUSTERS IN ATLAS

(8) Source	(9) Ptm.	(10) V_l/B_l	(11) μ Source	(12) RV	(13) Source	(14) Radius
13,98,132	pe + pg	$16^m.40$ 17 . 57	160,161,163	−14	150	–
231	pe + pg	19 . 97 21 . 55	–	−49	93	5′.5
132	pe + pg	15 . 43 16 . 98	–	–	–	5′
132,210	pe + pg	14 . 51 15 . 36	160,161,200	−41	101,245 280,302	–
169	pe + pg	14 . 87 15 . 89	–	–	–	3′
132,187 216	pe + pg	13 . 76 14 . 06	160,161,207	−37	101,141, 233	–
187	pe + pg	13 . 76 14 . 06	160,161,207	–	–	–
132,212	pe	15 . 69 16 . 80	–	−31	212	3′
187	pe + pg	13 . 76 14 . 06	–	–	–	–
132,187	pe + pg	15 . 48 16 . 08	115	−32	141,233	–
132	pe + pg	16 . 25 17 . 03	–	–	–	5′.5
124	pe UBV_E	12 . 33 12 . 93	55	−4	226,291	

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cluster	$\alpha_{1900}/\delta_{1900}$	l^{II}/b^{II}	r(pc)	$(m-M)_o$	Source	E_{B-V}
Stock 2	$2^h\ 07^m.7$ +58° 48′	133°.4 −01.9	320	$7^m.5$	155	$0^m.38$*
NGC 869 h Per	$2^h\ 12.0$ +56° 41	134.6 −03.7	2300	11.8	241	0.56*
NGC 884 χ Per	$2^h\ 15.4$ +56° 39	135.1 −03.6	2600	12.1	241	0.56*
IC 1805	$2^h\ 25.2$ +61° 00	134.7 +01.0	2000	11.5	118,132	0.76*
NGC 957	$2^h\ 26.4$ +57° 05	136.3 −02.7	2200	11.7	132	0.80*
Tr 2	$2^h\ 30.2$ +55° 32	137.4 −03.9	600	8.8	132	0.32
NGC 1027	$2^h\ 35.0$ +61° 07	135.8 +01.5	1300	10.5	132	0.40
NGC 1039 M34	$2^h\ 35.6$ +42° 21	143.6 −15.6	450	8.2	127	0.08
IC 1848	$2^h\ 43.3$ +60° 01	137.2 +00.1	2200	11.7	132	0.61*
NGC 1245	$3^h\ 07.8$ +46° 52	146.6 −08.9	2300	11.8	47,132	0.27
Mel 20 α Per	$3^h\ 15$ +48° 15	147.0 −07.1	170	6.1	132,198	0.09
NGC 1342	$3^h\ 25.2$ +36° 59	155.0 −15.4	550	8.7	132	0.28
IC 348 ο Per	$3^h\ 38.3$ +31° 56	160.4 −17.7	380	7.9	99	0.47

(8) Source	(9) Ptm.	(10) V_l/B_l	(11) μ Source	(12) RV	(13) Source	(14) Radius
155	pe	$14^m.82$ 16 . 30	–	–	–	30′
138,241	pe + pg	17 . 04 18 . 17	53,162,184 193	–22	233,302	3′
138,241	pe + pg	17 . 04 18 . 17	53,160,162 193	–21	233,302	3′
118,132	pe + pg	13 . 94 14 . 72	279,280	–34	101,233, 273,302	–
132	pe + pg	15 . 23 15 . 85	–	–35	141	4′
132	pe + pg	15 . 26 16 . 27	–	–	–	4′
132	pe + pg	15 . 57 16 . 23	–	–	–	4′
126	pe	12 . 20 12 . 84	40		–	–
132	pe + pg	15 . 35 16 . 26	–	–	–	–
47,132	pe + pg	16 . 46 17 . 16	–			4′.5
132,198	pe	12 . 11 12 . 70	103	2	102,152	–
132	pe + pg	14 . 97 15 . 77		–	–	6′
99	pe	13 . 43 14 . 66	24,91	–	–	–

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cluster	$\alpha_{1900}/\delta_{1900}$	l^{II}/b^{II}	r(pc)	$(m\text{-}M)_o$	Source	E_{B-V}
Pleiades M45	$3^h\ 41^m$ $+23°\ 48'$	$166\overset{\circ}{.}6$ -23.5	120	$5\overset{m}{.}5$	116,200	$0\overset{m}{.}04$
NGC 1444	$3^h\ 41.9$ $+52°\ 21$	$148\overset{\circ}{.}1$ -01.3	1000	10.0	132	0.70*
NGC 1502	$3^h\ 58.7$ $+62°\ 03$	143.6 $+07.6$	900	9.8	132,217	0.77*
NGC 1528	$4^h\ 07.8$ $+50°\ 59$	152.0 $+00.3$	800	9.5	132	0.29
NGC 1545	$4^h\ 13.4$ $+50°\ 00$	153.4 $+00.2$	800	9.5	132	0.36
Hyades	$4^h\ 21$ $+15°\ 37$	180.1 -22.4	40	3.0	41,293	0.00
NGC 1647	$4^h\ 40.2$ $+18°\ 53$	180.4 -16.8	550	8.7	132	0.39
NGC 1662	$4^h\ 42.9$ $+10°\ 45$	187.7 -21.1	410	8.1	132	0.34
NGC 1664	$4^h\ 43.9$ $+43°\ 31$	161.7 -00.5	1100	10.2	132	0.20
NGC 1778	$5^h\ 01.3$ $+36°\ 55$	168.9 -02.0	1400	10.7	132	0.34
NGC 1817	$5^h\ 06.3$ $+16°\ 34$	186.1 -13.1	1700	11.2	217	0.30
An (Bok)	$5^h\ 12.5$ $-68°\ 33$	279 -34	420	8.1	232	0.06
NGC 1893	$5^h\ 16.1$ $+33°\ 18$	173.6 -01.7	4000	13.0	106,132	0.44*

(8) Source	(9) Ptm.	(10) V_l/B_l	(11) μ Source	(12) RV	(13) Source	(14) Radius
116,200	pe	$15^m.64$ 16 . 65	23,185,270	+ 5	253,270	–
132	pe + pg	16 . 41 17 . 77	–	–	–	6′
132,217	pe + pg	14 . 69 15 . 97	113,280	–16	101,233, 259,302	–
132	pe + pg	15 . 34 16 . 24	–	–	–	7′
132	pe + pg	15 . 00 15 . 88	–	–	–	–
133	pe	11 . 03 12 . 32	7,41	+43	41,205, 293	–
132	pe + pg	16 . 11 17 . 99	–	–	–	14′
132	pe + pg	15 . 12 15 . 99	–	–	–	7′
132	pe + pg	15 . 08 15 . 72	–	–	–	6′
132	pe + pg	16 . 31 17 . 10	–	–	–	–
217	pe + pg	16 . 39 17 . 33	–	–	–	–
232	pe	12 . 75 13 . 33	204			
106,132	pe + pg	16 . 03 16 . 63	–	–10	259	4′

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cluster	$\alpha_{1900}/\delta_{1900}$	l^{II}/b^{II}	r(pc)	$(m-M)_o$	Source	E_{B-V}
NGC 1907	$5^h\ 21^m.4$ $+35°\ 14'$	$172°.6$ $+00.3$	1400	$10^m.7$	132,218	$0^m.42$*
NGC 1912 M38	$5^h\ 22.0$ $+35°\ 45$	172.3 $+00.9$	1300	10.6	132	0.27
NGC 1960 M36	$5^h\ 29.5$ $+34°\ 04$	174.5 $+01.0$	1300	10.5	127	0.24
Trapezium	$5^h\ 30.4$ $-05°\ 27$	209.0 -19.4	700	8.3	127,247, 248,286	0.06*
NGC 2099 M37	$5^h\ 45.8$ $+32°\ 31$	177.7 $+03.1$	1400	10.7	38,132, 294	0.31
NGC 2129	$5^h\ 55.0$ $+23°\ 18$	186.6 $+00.1$	2100	11.6	132	0.67*
NGC 2158	$6^h\ 01.3$ $+24°\ 06$	186.6 $+01.8$	8700	14.7	12	0.43
NGC 2168 M35	$6^h\ 02.7$ $+24°\ 21$	186.6 $+02.2$	850	9.7	132	0.23
NGC 2169	$6^h\ 02.8$ $+13°\ 58$	195.6 -02.3	1000	10.0	17,132	0.14
NGC 2244	$6^h\ 27.0$ $+04°\ 56$	206.4 -02.0	1700	11.1	131	0.46
NGC 2251	$6^h\ 29.3$ $+08°\ 26$	203.6 $+00.1$	1600	11.0	132	0.20
NGC 2264	$6^h\ 35.5$ $+09°\ 59$	202.9 $+02.2$	850	9.6	281	0.08
NGC 2281	$6^h\ 42.0$ $+41°\ 10$	175.0 $+17.1$	480	8.4	5,213	0.10

(8) Source	(9) Ptm.	(10) V_l/B_l	(11) μ Source	(12) RV	(13) Source	(14) Radius
132,218	pe + pg	$16^m.62$ 17 . 69	160,162	–	–	–
132	pe + pg	15 . 31 15 . 84	8,160,162	–	–	–
137	pe	12 . 42 12 . 86	36,37,112, 192,209	– 4	101,233	–
248,286	pe	15 . 22 16 . 01	–	+25	142,258	10′
38,132, 294	pe + pg	17 . 70 18 . 59	36,37,143 196	–	–	–
132	pe + pg	16 . 54 17 . 38	–	+18	101,233	6′
12	pe + pg	19 . 04 19 . 80	196	–	–	r 1-3
132	pe + pg	14 . 27 14 . 77	59,162,196 251,252	– 5	259	-
17,132	pe + pg	13 . 25 14 . 29	–	+16	101,141, 233	–
131	pe	13 . 62 14 . 13	–	+34	101,141, 233	–
132	pe + pg	16 . 90 17 . 55	–	–	–	6′
281	pe + pg	17 . 06 18 . 14	278	+21	272	–
5,213	pe + pg	11 . 98 12 . 42	275	+21	302	–

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cluster	$\alpha_{1900}/\delta_{1900}$	l^{II}/b^{II}	r(pc)	$(m\text{-}M)_o$	Source	E_{B-V}
NGC 2286	$6^h\ 42^m.6$ $-03°\ 04'$	$215°.3$ -02.3	1300	$10^m.6$	45	$0^m.41$
NGC 2287 M41	$6^h\ 42.7$ $-20°\ 38$	231.1 -10.2	650	9.1	132	0.00
NGC 2301	$6^h\ 46.6$ $+00°\ 35$	212.6 $+00.3$	750	9.4	96,132	0.03
Cr 121	$6^h\ 50.0$ $-24°\ 30$	235.4 -10.4	650	9.0	82	0.03
NGC 2323	$6^h\ 58.2$ $-08°\ 12$	221.7 -01.3	1000	10.1	17,132	0.24
NGC 2324	$6^h\ 59.0$ $+01°\ 12$	213.4 $+03.3$	2900	12.3	18,132	0.11
NGC 2353	$7^h\ 09.8$ $-10°\ 08$	224.7 $+00.4$	1000	10.1	132	0.12
NGC 2354	$7^h\ 10.1$ $-25°\ 34$	238.4 -06.8	1800	11.3	54	0.14
NGC 2360	$7^h\ 13.2$ $-13°\ 27$	229.8 -01.4	1100	10.3	18,66	0.07
NGC 2362 τ CMa.	$7^h\ 14.6$ $-24°\ 26$	238.2 -05.5	1600	11.0	121, 127,137	0.11
Cr 140	$7^h\ 20$ $-32°\ 00$	245.2 -07.9	360	7.8	300	0.00
NGC 2395	$7^h\ 21.5$ $+13°\ 47$	204.6 $+14.0$	1200	10.4	45	0.72
Mel 66	$7^h\ 23.4$ $-47°\ 32$	259.6 -14.3	2500	12.0	71	0.13

(8) Source	(9) Ptm.	(10) V_l/B_l	(11) μ Source	(12) RV	(13) Source	(14) Radius
45	pe + pg	$14^{m}.19$ 14 . 62	–	–	–	–
132	pe + pg	13 . 96 14 . 67	49	+34	49	–
96,132	pe + pg	16 . 99 17 . 88	239	–	–	–
82	pe	10 . 40 10 . 36	–	–	–	30′
17,132	pe + pg	15 . 11 15 . 92	–	–	–	6′
18,132	pe + pg	15 . 46 15 . 96	–	–	–	3′
132	pe + pg	14 . 71 15 . 26	–	–	–	5′
54	pe + pg	14 . 70 15 . 72	–	–	–	7′
18,66	pe	17 . 24 18 . 32	–	–	–	–
137	pe	14 . 75 15 . 25	–	+33	101,141, 145,233	–
300	pe	10 . 95 12 . 54	300	+18	300	–
45	pe + pg	13 . 76 14 . 25	–	–	–	–
71	pe + pg	15 . 76 16 . 02	–			15′

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cluster	$\alpha_{1900}/\delta_{1900}$	l^{II}/b^{II}	r(pc)	$(m\text{-}M)_o$	Source	E_{B-V}
NGC 2422	$7^h\ 32^m.0$ $-14°\ 16'$	231°.0 +03.1	480	$8^m.4$	132,254	$0^m.08$
NGC 2420	$7^h\ 32.5$ $+21°\ 48$	198.1 +19.6	2600	12.1	234,294	0.00
NGC 2423	$7^h\ 32.5$ $-13°\ 28$	230.5 +03.5	850	9.7	254	0.13
NGC 2437 M46	$7^h\ 37.2$ $-14°\ 35$	231.9 +04.1	1700	11.1	254	0.14
NGC 2451	$7^h\ 41.8$ $-37°\ 44$	252.4 −06.7	320	7.5	81,299, 301	0.04
NGC 2467	$7^h\ 48.3$ $-26°\ 08$	243.1 +01.4	4200	13.1	173,174	0.54
NGC 2477	$7^h\ 48.7$ $-38°\ 17$	253.6 −05.8	1000	10.0	70	0.25
NGC 2483	$7^h\ 50.7$ $-27°\ 36$	244.7 +00.1	3500	12.7	170	0.45
NGC 2489	$7^h\ 54.2$ $-28°\ 56$	246.7 −00.8	1200	10.4	170	0.36
NGC 2506	$7^h\ 55.2$ $-10°\ 31$	230.6 +09.9	2200	11.7	220	0.10
NGC 2516	$7^h\ 56.7$ $-60°\ 36$	274.0 −15.9	330	7.6	17,73	0.11
NGC 2533	$8^h\ 3.0$ $-29°\ 37$	247.8 +01.3	2800	12.2	167	0.34
NGC 2539	$8^h\ 06.0$ $-12°\ 32$	233.7 +11.1	1300	10.5	213	0.10

(8) Source	(9) Ptm.	(10) V_l/B_l	(11) μ Source	(12) RV	(13) Source	(14) Radius
132,254	pe + pg	$14^m.03$ 13 . 85	240	–	–	–
234,294	pe + pg	17 . 51 18 . 23	–	–	–	2′.3
254	pe + pg	14 . 03 13 . 85	240	–	–	–
254	pe + pg	14 . 03 13 . 85	194	+42	52,206	–
81,299, 301	pe UU_cBV	13 . 35 14 . 88	301	+26	81,301	
173,174	pe	14 . 00 14 . 54	–	–	–	8′
70	pe + pg	15 . 73 16 . 43	70		–	5′
170	pe + pg	13 . 84 14 . 72	–	–	–	5′
170	pe + pg	13 . 84 14 . 72	–	–	–	3′
220	pe + pg	16 . 77 17 . 42	–	–	–	–
17,73	pe	8 . 54 8 . 59	73	+21	50,73	
167	pe + pg	14 . 08 14 . 94	–	–	–	5′
213	pe	13 . 79 15 . 09	–			10′

(1) Cluster	(2) $\alpha_{1900}/\delta_{1900}$	(3) l^{II}/b^{II}	(4) r(pc)	(5) $(m-M)_o$	(6) Source	(7) E_{B-V}
NGC 2547	8^h 07 . 7 −48° 58′	264° . 6 −08 . 6	420	$8^m.1$	86	$0^m.04$
NGC 2546	8^h 08 . 2 −37° 20	254 . 9 −02 . 0	1000	10 . 0	89,168	0 . 16
NGC 2548	8^h 08 . 8 −05° 30	227 . 9 +15 . 3	650	9 . 0	213	0 . 04
Pi 1	8^h 12 . 9 −27° 56	255 . 1 −00 . 8	2000	11 . 5	168	0 . 51
NGC 2567	8^h 14 . 6 −30° 20	249 . 8 +03 . 0	1700	11 . 2	167	0 . 12
NGC 2571	8^h 14 . 9 −29° 26	249 . 1 −03 . 6	2100	11 . 6	167	0 . 32
NGC 2579	8^h 17 . 3 −35° 52	254 . 7 +00 . 3	1000	10 . 1	168	0 . 15
Cr 185	8^h 18 . 3 −35° 50	254 . 8 +00 . 5	1500	10 . 9	168	0 . 21
NGC 2632 M44— Praesepe	8^h 34 . 3 +20° 20	205 . 5 +32 . 5	160	6 . 0	122,127	0 . 00
IC 2391 *o* Vel	8^h 37 . 4 −52° 42	270 . 4 −06 . 9	160	6. 0	109,179	0 . 02
IC 2395	8^h 38 . 0 −47° 50	266 . 6 −03 . 8	950	9 . 9	179	0 . 11
NGC 2670	8^h 42 . 3 −48° 25	267 . 5 −03 . 6	950	9 . 9	179	0 . 48
Tr 10	8^h 44 . 2 −42° 07	262 . 8 +00 . 6	420	8 . 1	179	0 . 06

(8) Source	(9) Ptm.	(10) V_l/B_l	(11) μ Source	(12) RV	(13) Source	(14) Radius
86	pe U_cBV	$11^m.51$ 11 . 69	87	+16	73,87	–
89,168	pe + pg	14 . 08 14 . 94	–	–	–	25′
213	pe	11 . 51 11 . 75	56	–	–	–
168	pe + pg	14 . 08 14 . 94	–	–	–	1′.5
167	pe + pg	14 . 08 14 . 94	–	–	–	4′
167	pe + pg	14 . 08 14 . 94	–	–	–	4′
168	pe + pg	14 . 08 14 . 94	–	–	–	4′
168	pe + pg	14 . 08 14 . 94	–	–	–	4′
122	pe	14 . 94 16 . 42	97,147	+33	188,303	–
109,179	pe	11 . 80 12 . 09	109,179	+14	43,78	–
179	pe + pg	12 . 31 12 . 57	–	–	–	–
179	pe + pg	12 . 31 12 . 57	–	–	–	5′
179	pe	10 . 97 11 . 26	–	–	–	–

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cluster	$\alpha_{1900}/\delta_{1900}$	l^{II}/b^{II}	r(pc)	$(m-M)_o$	Source	E_{B-V}
NGC 2682 M67	$8^h\ 45.0$ $+12°\ 4'$	$215°.6$ $+31.7$	800	$9^m.5$	69,127	$0^m.06$
NGC 3114	$9^h\ 59.5$ $-59°\ 38$	283.3 -03.8	900	9.8	119,179	0.06
NGC 3228	$10^h\ 17.6$ $-51°\ 13$	280.7 $+04.6$	500	8.5	110	0.03
IC 2581	$10^h\ 23.7$ $-57°\ 08$	284.6 $+00.0$	2100	11.6	89,171	0.40
NGC 3293	$10^h\ 32.0$ $-57°\ 43$	285.9 $+00.1$	2600	12.1	75	0.28*
Mel 101	$10^h\ 38.6$ $-64°\ 34$	289.9 -05.6	2100	11.6	31	0.48*
IC 2602 θ Car	$10^h\ 39.4$ $-63°\ 52$	289.6 -04.9	150	5.9	29,30,295	0.04
Tr 15	$10^h\ 40.9$ $-58°\ 50$	287.4 -00.4	1700	11.1	95	0.53
Tr 16 η Car	$10^h\ 41.2$ $-59°\ 11$	287.6 -00.7	2500	12.0	18,79,83	0.44
Tr 17	$10^h\ 52.2$ $-58°\ 41$	288.7 $+00.4$	1400	10.7	249	0.7
NGC 3496	$10^h\ 55.8$ $-39°\ 48$	289.6 -00.4	1100	10.2	249	0.5
An (Feinstein)a	$11^h\ 1.8$ $-59°\ 17$	290.0 $+00.4$	1200	10.4	80	0.4
NGC 3532	$11^h\ 02.2$ $-58°\ 08$	289.6 $+01.5$	440	8.2	148	0.01

(8) Source	(9) Ptm.	(10) V_l/B_l	(11) μ Source	(12) RV	(13) Source	(14) Radius
69,139	pe	$16^m.19$ 17 . 85	57,183,203	+33	214,215	–
119,179	pe + pg U_cUBV	13 . 84 14 . 02	119	–	–	12′.5
110	pe	14 . 53 15 . 50	110	–	–	–
89,179	pe U_cBV	13 . 78 13 . 72	–	– 3	171	4′
75	pe BV	12 . 97 13 . 20	–	– 14	141,145	–
31	pe U_cBV	12 . 17 12 . 40	–	–	–	–
29,30,295	pe + pg U_cUBV	10 . 70 11 . 32	30	+24	30	–
95	pe + pg U_cBV	– –	–	–	–	1′.8
18,79,83	pe	12 . 00 12 . 25	–	–	–	3′
249	pe + pg	14 . 56 15 . 62	–	–	–	–
249	pe + pg	14 . 56 15 . 62	–	–	–	–
80	pe	10 . 57 10 . 6	–	–	–	–
148	pe + pg U_cBV	11 . 72 11 . 93	148	–	–	–

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cluster	$\alpha_{1900}/\delta_{1900}$	l^{II}/b^{II}	r(pc)	$(m\text{-}M)_o$	Source	E_{B-V}
NGC 3572	$11^h\ 06^m.2$ $-59°\ 42'$	$290°.7$ $+00.2$	3200	$12^m.5$	243	$0^m.45$*
Tr 18	$11^h\ 07.2$ $-60°\ 08$	291.0 -00.1	2300	11.8	243	0.34*
NGC 3590	$11^h\ 08.7$ $-\ 6°\ 15$	291.2 -00.1	1800	11.3	243	0.19*
NGC 3603	$11^h\ 10.8$ $-60°\ 43$	291.6 -00.5	3500	12.7	249	1.42*
Mel 105	$11^h\ 15.2$ $-62°\ 58$	292.9 -02.4	2100	11.6	249	0.38
NGC 3680	$11^h\ 20.9$ $-42°\ 41$	286.8 $+16.9$	800	9.5	68	0.04
NGC 3766	$11^h\ 31.5$ $-61°\ 03$	294.1 $+00.1$	1700	11.1	3,154,249	0.18
IC 2944	$11^h\ 32.0$ $-62°\ 68$	294.6 -01.4	2000	11.5	265	0.33
NGC 4349	$12^h\ 19.0$ $-61°\ 20$	299.8 $+00.8$	–	–	–	0.33
Mel 111 Coma	$12^h\ 20.0$ $+26°\ 40$	221.1 $+84.1$	80	4.5	127,189	0.00
NGC 4755 κ Crucis	$12^h\ 47.7$ $-59°\ 48$	303.2 $+02.5$	850	9.6	76,104	0.31
NGC 5316	$13^h\ 46.9$ $-61°\ 22$	310.2 $+00.1$	1100	10.2	222	0.18
Lynga 2	$14^h\ 20.3$ $-61°\ 10$	313.8 -00.5	1100	10.2	165	0.19

(8) Source	(9) Ptm.	(10) V_l/B_l	(11) μ Source	(12) RV	(13) Source	(14) Radius
243	pe + pg	$13^m.05$ 13 . 43	–	−10	244	5′
243	pe + pg U_cUBV	13 . 05 13 . 43	–	–	–	6′
243	pe + pg	13 . 05 13 . 43	–	–	–	4′
249	pe + pg	15 . 02 15 . 65	–	–	–	0′.5
249	pe + pg	14 . 98 16 . 09	–	–	–	
68	pe	15 . 24 16 . 12	–	–	–	5′
3,154,249	pe + pg	13 . 98 15 . 13	–	–	–	–
265	pe	14 . 99 15 . 72	–	+ 2	145,265	–
89,125	pe + pg U_cUBV	14 . 70 15 . 04	–	–	–	4′
189	pe	11 . 67 12 . 15	271	0	151	–
76,104	pe + pg U_cBV	13 . 38 13 . 97	–	−18	76,104, 141,145	3′
222	pe + pg	13 . 80 14 . 46	–	–	–	7′
165	pe + pg	13 . 06 13 . 40	–	–	–	4′

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cluster	$\alpha_{1900}/\delta_{1900}$	l^{II}/b^{II}	r(pc)	$(m\text{-}M)_o$	Source	E_{B-V}
NGC 5606	$14^h\ 20^m.5$ $-59°\ 11'$	314°.9 +01.0	1700	11.1	181	0.45
NGC 5617	$14^h\ 22.3$ $-60°\ 16$	314.7 −00.1	1100	10.3	165	0.53*
Tr 22	$14^h\ 23.7$ $-60°\ 43$	314.7 −00.6	1700	11.2	166	0.53
Hogg 17	$14^h\ 26.2$ $-60°\ 56$	314.9 −00.9	1700	11.1	166	0.54
Cr 285 UMa cl	$14^h\ 36.0$ $+70°\ 00$	110.3 +44.9	25	2.0	64	–
NGC 5749	$14^h\ 41.6$ $-54°\ 06$	319.5 +04.5	850	9.7	181	0.45
NGC 5822	$14^h\ 57.9$ $-53°\ 57$	321.7 +03.6	700	9.3	209	0.19
NGC 5823	$14^h\ 58.3$ $-55°\ 12$	321.2 +02.6	700	9.2	39	0.18
Pi 20	$15^h\ 07.6$ $-58°\ 42$	320.5 −01.2	4400	13.2	182	1.22
NGC 6031	$15^h\ 59.8$ $-53°\ 47$	329.3 −01.5	3200	12.5	164	0.43
NGC 6067	$16^h\ 05.4$ $-53°\ 57$	329.8 −02.2	2000	11.5	72,264	0.32
NGC 6087	$16^h\ 10.6$ $-57°\ 39$	327.8 −05.4	850	9.6	33,88, 156	0.21
NGC 6124	$16^h\ 18.8$ $-40°\ 26$	340.8 +06.0	500	8.5	148,268	0.68

(8) Source	(9) Ptm.	(10) V_l/B_l	(11) μ Source	(12) RV	(13) Source	(14) Radius
181	pe	$11^m.89$ 13 . 97	–	–	–	1′
165	pe + pg	13 . 06 13 . 40	–	–	–	4′
166	pe + pg	13 . 06 13 . 40	–	–	–	4′
166	pe + pg	13 . 06 13 . 40	–	–	–	4′
–	pe	9 . 73 10 . 91	64,225	16	64,225	–
181	pe	12 . 11 12 . 47	–	–	–	–
209	pe + pg UBVR	13 . 70 14 . 72	–	–	–	30′
39	pe + pg UBVR	14 . 16 15 . 78	–	–	–	5′
182	pe	14 . 19 15 . 17	–	–	–	–
164	pe + pg	15 . 27 16 . 24	–	–	–	–
72,264	pe + pg	15 . 27 16 . 24	–	–43	264	4′
33,88, 156	pe U_cUBV	14 . 47 15 . 33	156	+ 3	74,144 156,256	–
148,268	pe + pg	16 . 25 17 . 84	–	–	–	3′

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cluster	$\alpha_{1900}/\delta_{1900}$	l^{II}/b^{II}	r(pc)	$(m\text{-}M)_o$	Source	E_{B-V}
NGC 6193	$16^h\ 33^m.8$ $-48°\ 34'$	$336°.7$ -01.6	1300	$10^m.6$	296	$0^m.49$*
NGC 6204	$16^h\ 39.1$ $-46°\ 50$	338.6 -01.1	–	–	–	0.60*
NGC 6231	$16^h\ 47.0$ $-41°\ 38$	343.5 $+01.2$	1700	11.2	28,242, 246	0.42
NGC 6322	$17^h\ 11.3$ $-42°\ 50$	345.3 -03.1	1200	10.4	176	0.60
NGC 6383	$17^h\ 28.2$ $-32°\ 30$	355.1 $+00.1$	1300	10.6	172,267	0.32
NGC 6405 M6	$17^h\ 33.5$ $-32°\ 09$	356.6 -00.7	500	8.6	62,223, 263	0.15
IC 4665	$17^h\ 41.4$ $+05°\ 45$	30.6 $+17.1$	350	7.7	4,111,127	0.17
NGC 6475 M7	$17^h\ 47.5$ $-34°\ 47$	355.9 -04.5	240	6.9	132,148	0.06
NGC 6494	$17^h\ 51.0$ $-19°\ 00$	9.8 $+02.9$	650	9.1	132	0.38*
NGC 6530	$17^h\ 58.6$ $-24°\ 23$	6.1 -01.1	1700	11.2	127,282	0.37*
NGC 6531 M21	$17^h\ 58.6$ $-22°\ 30$	7.7 -00.4	1300	10.5	132	0.27
NGC 6611 M16	$18^h\ 13.2$ $-13°\ 49$	17.0 $+00.8$	2900	12.3	132,285	0.48*
NGC 6633	$18^h\ 22.7$ $+06°\ 30$	36.1 $+08.3$	320	7.5	106	0.17

(8) Source	(9) Ptm.	(10) V_l/B_l	(11) μ Source	(12) RV	(13) Source	(14) Radius
296	pe	$11^m.76$ 12 . 50	–	−26	145	–
296	pe + pg	11 . 76 12 . 50	–	−38	145	3′
28,246	pe + pg	14 . 41 15 . 44	32	−22	101,141 233,257	–
176	pe + pg	13 . 70 14 . 92	–	–	–	–
172,267	pe + pg	13 . 94 14 . 92	–	− 4	101,145, 233	10′
62,223, 263	pe	15 . 42 16 . 44	–	–	–	11′
4,111,125	pe	11 . 58 12 . 10	274	−12	2	–
132,148	pe + pg	12 . 34 12 . 70	44	−14	1,44,78	13′
132	pe + pg	15 . 59 16 . 57	–	–	–	6′
282	pe	16 . 18 17 . 45	–	− 9	101,141, 233	–
132	pe + pg	14 . 54 15 . 50	–	− 9	101,145, 233	2′.5
132,285	pe + pg	16 . 75 17 . 84	238	+20	101,141, 145,233	–
106	pe	15 . 10 16 . 37	276		–	

(1) Cluster	(2) $\alpha_{1900}/\delta_{1900}$	(3) l^{II}/b^{II}	(4) r(pc)	(5) $(m\text{-}M)_o$	(6) Source	(7) E_{B-V}
IC 4725 M25	$18^h\ 25^m.8$ $-19°\ 19'$	$13°.6$ -04.5	600	$8^m.9$	129,156, 292	$0^m.50$*
NGC 6649	$18^h\ 27.9$ $-10°\ 28$	21.6 -00.8	1300	10.6	267	1.22
NGC 6664	$18^h\ 31.3$ $-08°\ 18$	23.9 -00.5	1400	10.8	10	0.60*
IC 4756	$18^h\ 34.0$ $+05°\ 22$	36.4 $+05.3$	440	8.2	4	0.22
Tr 35	$18^h\ 37.7$ $-04°\ 14$	28.3 -01.4	2000	11.5	132,304	1.19
NGC 6694 M26	$18^h\ 39.8$ $-09°\ 30$	23.9 -02.9	1500	10.9	132	0.58
NGC 6705 M11	$18^h\ 45.7$ $-06°\ 23$	27.3 -02.8	1700	11.2	127,140	0.42
NGC 6709	$18^h\ 46.7$ $+10°\ 14$	42.2 $+04.7$	900	9.8	132	0.30
An (Stephenson) ὸ Lyr	$18^h\ 50.0$ $+36°\ 47$	16.9 $+15.5$	320	7.5	65	0.05
NGC 6755	$19^h\ 02.8$ $+04°\ 36$	38.6 -01.7	1800	11.3	132	0.93
NGC 6791	$19^h\ 17.3$ $+37°\ 39$	70.0 $+10.9$	5200	13.6	146	0.22
NGC 6802	$19^h\ 26.2$ $+20°\ 04$	55.3 $+00.9$	1100	10.2	132	0.81*
NGC 6819	$19^h\ 37.9$ $+39°\ 57$	74.0 $+08.5$	1600	11.0	221	0.26

(8) Source	(9) Ptm.	(10) V_l/B_l	(11) μ Source	(12) RV	(13) Source	(14) Radius
129,156, 292	pe	$14^m.85$ 15 . 75	156	+ 4	74,144, 256,289	–
267	pe + pg BV	15 . 56 17 . 20	–	–	–	5′
10	pe + pg	17 . 69 18 . 96	–	+23	10,150	–
4	pe	10 . 98 11 . 37	–	–	–	15′
132,304	pe + pg	16 . 66 17 . 89	–	–	–	3′
132	pe + pg	15 . 40 16 . 19	–	+ 4	101,141	4′
140	pe + pg	16 . 01 17 . 66	36,37,190	+22	101,141	–
132	pe + pg	16 . 78 17 . 54	–	–15	101,141	–
65	pe	17 . 35 18 . 07	–	–26	65	5′
132	pe + pg	15 . 70 16 . 76	–	–	–	8′
146	pe + pg BV	19 . 96 21 . 50	–	70	146	1′
132	pe + pg	16 . 33 17 . 27	–	–	–	3′
221	pe	16 . 58 17 . 30	–	–	–	4′

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cluster	$\alpha_{1900}/\delta_{1900}$	l^{II}/b^{II}	r(pc)	$(m\text{-}M)_o$	Source	E_{B-V}
NGC 6823	$19^h\ 38^m.2$ +23° 04′	59°.4 −00.1	1600	11m.0	132	0m.82*
NGC 6830	$19^h\ 46.6$ +22° 30	60.1 −01.8	1700	11.2	132	0.53*
NGC 6834	$19^h\ 48.2$ +28° 09	65.7 +01.2	2500	12.0	92,132	0.66*
NGC 6866	$20^h\ 00.5$ +43° 43	79.4 +06.8	1200	10.4	132	0.14
NGC 6871	$20^h\ 02.1$ +35° 30	72.6 +02.1	1800	11.3	132,216, 259	0.46*
NGC 6882	$20^h\ 07.5$ +26° 15	65.6 −04.0	600	8.9	132	0.08
IC 4996	$20^h\ 12.8$ +37° 20	75.4 +01.3	1700	11.1	132,216	0.64
NGC 6910	$20^h\ 19.5$ +45° 27	78.7 +02.0	1700	11.1	132	1.05*
NGC 6913 M29	$20^h\ 20.3$ +30° 12	76.9 +00.6	1100	10.3	132	0.83*
NGC 6939	$20^h\ 29.4$ +60° 18	95.9 +12.3	1300	10.5	46	0.50
NGC 6940	$20^h\ 30.4$ +27° 58	69.9 −07.2	850	9.6	132,159	0.26*
NGC 7031	$21^h\ 04.1$ +50° 26	91.3 +02.3	1100	10.3	132	0.93
NGC 7062	$21^h\ 19.6$ +46° 57	89.9 −02.7	1700	11.2	85,132	0.25

(8) Source	(9) Ptm.	(10) V_l/B_l	(11) μ Source	(12) RV	(13) Source	(14) Radius
132	pe + pg	$15^m.60$ 16 . 55	–	+ 2	259	3′
132	pe + pg	15 . 22 16 . 06	–	–	–	–
92,132	pe + pg	15 . 77 16 . 41	–	–	–	2′
132	pe + pg	15 . 43 16 . 46	–	–	–	3′.5
132,216, 259	pe + pg	12 . 91 13 . 16	–	–14	101,233	–
132	pe	15 . 46 16 . 50	160,162,192, 235	–	–	3′
132,216	pe + pg	15 . 00 15 . 77	113,239	–	–	–
132	pe + pg	14 . 88 15 . 83	–	–33	101,141, 233	5′
132	pe + pg	15 . 38 16 . 32	–	–28	101,141, 233	3′.5
46	pe + pg	14 . 68 15 . 39	191	–	–	–
132	pe + pg	15 . 65 16 . 45	277	+ 5	290	
132	pe + pg	17 . 18 18 . 16	–	–	–	3′.5
85,132	pe + pg	15 . 65 16 . 56				3′.5

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cluster	$\alpha_{1900}/\delta_{1900}$	l^{II}/b^{II}	r(pc)	$(m\text{-}M)_o$	Source	$E_{B\text{-}V}$
NGC 7063	$21^h\ 20^m.4$ $+36°\ 04'$	$83°.1$ -09.9	650	$9^m.0$	132	$0^m.08$
NGC 7067	$21^h\ 20.6$ $+47°\ 35$	91.2 -01.7	3600	12.8	21,132	0.85*
NGC 7086	$21^h\ 27.1$ $+51°\ 09$	94.4 $+00.2$	1300	10.5	100,132	0.70
NGC 7092 M39	$21^h\ 28.6$ $+48°\ 00$	92.5 -02.3	260	7.1	123	0.01
Tr 37 IC 1396	$21^h\ 35.9$ $+57°\ 02$	99.3 $+03.7$	850	9.6	6,250	0.50
NGC 7128	$21^h\ 40.6$ $+53°\ 15$	97.4 $+00.4$	2500	12.0	132	0.92*
NGC 7142	$21^h\ 43.5$ $+65°\ 20$	105.4 $+09.5$	1000	10.0	132	0.18
IC 5146	$21^h\ 49.6$ $+46°\ 48$	94.4 -05.5	1000	10.0	284	0.45*
NGC 7160	$21^h\ 50.9$ $+62°\ 08$	104.0 $+06.5$	850	9.6	132,250	0.30
NGC 7209	$22^h\ 01.2$ $+46°\ 00$	95.5 -07.3	900	9.8	132	0.15
NGC 7235	$22^h\ 09.0$ $+56°\ 47$	102.7 $+00.8$	3500	12.7	19,132	0.95*
NGC 7261	$22^h\ 16.8$ $+57°\ 38$	104.0 $+00.8$	750	9.4	132	0.58
NGC 7380	$22^h\ 43.0$ $+57°\ 34$	107.1 -00.9	2100	11.6	132	0.50*

(8) Source	(9) Ptm.	(10) V_l/B_l	(11) μ Source	(12) RV	(13) Source	(14) Radius
132	pe + pg	$15^m.44$ 15 . 82	–	–	–	–
21,132	pe + pg	16 . 01 16 . 80	–	–	–	2′
100,132	pe + pg	15 . 66 17 . 07	–	–	–	5′
123	pe	10 . 95 11 . 45	58,160, 162,237	–	–	–
6,250	pe	9 . 32 9 . 65	–	–		–
132	pe + pg	17 . 21 18 . 11	–	–		2′
132	pe + pg	16 . 30 17 . 07	–	–		
284	pe + pg	17 . 03 17 . 98	–	–		–
132,250	pe + pg	14 . 48 16 . 01	–	25	141	7′
132	pe + pg	14 . 67 15 . 36	15,160,161, 240			
19,132	pe + pg	15 . 72 16 . 75				2′
132	pe + pg	16 . 18 17 . 14				
132	pe + pg	15 . 62 16 . 52		38	101,141, 233	5′.5

(1) Cluster	(2) $\alpha_{1900}/\delta_{1900}$	(3) l^{II}/b^{II}	(4) r(pc)	(5) $(m-M)_o$	(6) Source	(7) E_{B-V}
Markarian 50 (Basel 3)	$23^h\ 04^m.2$ $+59°\ 59'$	$110°.6$ $+00.1$	2200	$11^m.7$	94	$0^m.86$
NGC 7510	$23^h\ 07.3$ $+60°\ 02$	111.0 $+00.0$	3300	12.6	132	0.89*
King 19 (Basel 2)	$23^h\ 11.0$ $+59°\ 56$	111.4 -00.2	1300	10.6	94	0.82
NGC 7654 M52	$23^h\ 19.8$ $+61°\ 03$	112.8 $+00.5$	1900	11.4	132,211	0.60*
NGC 7762	$23^h\ 45.0$ $+67°\ 28$	117.2 $+05.8$	1000	10.0	48	1.02
NGC 7788	$23^h\ 51.7$ $+60°\ 50$	116.4 -00.8	2400	11.9	20	0.28
NGC 7789	$23^h\ 52.0$ $+56°\ 10$	115.5 -05.4	1800	11.3	11,42	0.26
NGC 7790	$23^h\ 53.4$ $+60°\ 39$	116.6 $+01.0$	3600	12.8	229	0.52

(8) Source	(9) Ptm.	(10) V_l/B_l	(11) μ Source	(12) RV	(13) Source	(14) Radius
94	pe + pg	$15^m.56$ 16 . 51	–	–	–	–
132	pe + pg	15 . 56 16 . 51	–	–	–	2′.5
94	pe + pg	15 . 56 16 . 51	–	–	–	–
132,211	pe + pg	16 . 07 16 . 82	60,177, 236	–35	211	–
48	pe	15 . 75 16 . 97	–	–	–	–
20	pe + pg	16 . 22 17 . 05	–	–	–	3′
11,42	pe + pg	16 . 45 17 . 01	195	–	–	–
229	pe + pg	16 . 22 17 . 05	–	–	–	2′.7

REMARKS ON THE CLUSTERS

NGC 129

The Cepheid DL Cas (G1Ib) is almost certainly a member (150, 163, 244). Three other supergiants–Arp numbers A (F5Ib), AA (K2Ib) and AB (M0 IIp)–appear in the cluster region. A is a probable member and AA and AB are unlikely members (150, 153, 163, 244). The colour-magnitude diagram contains those stars for which $\Delta\mu$ (161) and (or) membership probability $p \geq 30{:}17$ (163). Mean values were plotted for stars common to the three photometric studies (13, 98, 108).

NGC 188

Only stars in rings I and II were plotted (231). The very blue stars may be foreground objects. The four W UMa stars discovered by C. Hoffmeister (1964, *I.A.U. Inf. Bull. Var. Stars* No. 67) were not plotted.

NGC 225

Stars within a radius of 5′ centred on $x = 0, y = 0$ were plotted (108). The cluster probably contains at least two red giants (107, 260).).

NGC 457

Photoelectric values were plotted for stars with $\Delta\mu \leq 2\sqrt{2}\sigma$ (161, 280). The supergiants φ Cas (F0Ia-Ib) and HR7902 (B6eIb) are too bright to have reliable proper motions relative to the cluster. Radial velocity data, although difficult to evaluate, tend to indicate non-membership (233, 244, 245). From the photometry both could be cluster members (153, 244) and are included in the colour-magnitude diagram.

NGC 559

All stars in rings 1, 2, and 3 brighter than $V = 15.0$ were plotted (169). The four brightest stars are probably not members from their colours and spectral types.

NGC 581 (M103)

The colour-magnitude diagram contains stars which were considered members in both proper motion studies (161, 207). The colours and magnitudes are from all three photometric papers for the stars in common (108, 187, 219).

Tr 1

Stars which were proper motion members according to both investigations were plotted (161, 207).

NGC 654

Average photoelectric colours and magnitudes were plotted for stars inside a circle of 3′ radius centred on a point 7 mm. SE of no. 42 (212). HD 10494 (Pesch 1 – F51a) is probably a cluster member and the radial velocity quoted in the table is for this star only. There was disagreement in the distance for this cluster (132, 212) and Pesch's value was adopted as being consistent with the other clusters in the immediate vicinity.

NGC 659

Because of an apparent scale error no stars fainter than $V = 13.8$ were plotted.

NGC 663

Average values from the two photometric papers were plotted where possible (108, 187) for stars considered proper motion members–i.e. *H, h !* (115).

NGC 744

Only stars within a radius of 5′.5 around $x = 0, y = 0$ were plotted (108).

NGC 752

Combined photoelectric data were plotted for proper motion members (63). A more extensive photographic survey (224) was not plotted since the certain members were studied photoelectrically.

Stock 2

All stars within a 30′ radius of no. 94 were plotted. (155).

NGC 869 (h Per)

Only certain members within 3′ of 0o 1057 (208) were plotted. Stars were excluded (a) if there were no agreement among the proper motion studies, (b) if there were no proper motion data or (c) if a consensus of the proper motion studies indicated non-membership–i.e. $\Delta\mu > 2\sqrt{2}\sigma$ (162, 193) or the proper motion class was non-member (53, 184). Average photoelectric values were used when possible (138, 241, 297). Schild's determination of the distances for h and χ Per was adopted for these two clusters.

NGC 884 (χ Per)

As in the case of h Per average values for proper motion members were plotted, this time for stars within 3′ of a point halfway between 0o 2251 and 0o 2299.

IC 1805

Average photoelectric values (108, 118) were plotted for stars with $\Delta\mu \leq 2\,\sigma$ (280) or membership probability $p > 0.50$ (279).

NGC 957

Only stars within 4′ of $x = 1, y = 0.5$ were plotted (108).

Tr 2

All stars inside a circle of radius 4′ centred at $x = 0, y = 0$ were plotted (108).

NGC 1027

Star no. 1 with $V = 6.99$, $(B-V) = 0.37$, $(U-B) = -0.07$ and spectral class F2 V was considered a non-member (107). Only those stars within 4′ of $x = 0, y = 0$ were plotted (108).

NGC 1039 (M34)

Only proper motion members were plotted (40).

IC 1848

The supergiant HD 17971 (F51a) is probably not a cluster member (244).

NGC 1245

All stars within a radius of 4′.5 centred on no. 126 and brighter than $V = 16.5$ were plotted (47). Five of the brighter stars are not cluster members from their spectral classes (107).

Mel 20 (α Per)

Fifteen stars were considered non-members based on radial velocities (102, 152). α Per is a cluster member (102, 227).

NGC 1342

Only stars within 6′ of $x = 0, y = 0$ were plotted (108). Two F giants are possibly members and one G-type giant is probably not a cluster member (107, 259).

IC 348 (σ Per)

Stars 3 and 7 are not members from proper motions (24, 91). The reddening and distance modulus are based on spectrographic and photometric data for four stars (99).

Pleiades (M45)

The colour-magnitude diagram contains those stars which are cluster members based on proper motions and radial velocities—i.e. $\Delta\mu \leq 2.5\sigma$ (23), proper motion class I or II (185), or class * or X (270). These are all probable and possible members. Only photoelectric data were plotted (116, 135).

NGC 1444

All stars within 6′ of no. 1 are plotted (108).

NGC 1502

Average photometric values (108, 219) were plotted for all stars with $\Delta\mu \leq 2\sqrt{2}\sigma$ (280) or defined as cluster members (113).

NGC 1528

Only those stars within 7′ of no. 116 were plotted (108).

NGC 1545

Stars 101 and 102 are not members based on spectroscopic and photometric data and were not plotted (260).

Hyades

Only photoelectrically observed cluster members according to van Bueren (41) were plotted (133). The radial velocity quoted is from a re-evaluation of the convergent point and is only 0.6 km/sec different from van Bueren's value (293). The existence or extent of the subdwarf sequence is undetermined (7, 41, 67, 133, 136, 205, 293).

NGC 1647

All stars within a circle of radius 14′ around $x = -2$, $y = 7$ were plotted (108).

NGC 1662

The colour-magnitude diagram contains those stars inside a circle of radius 7′ around $x = 0$, $y = 7.5$ (108).

NGC 1664

All stars within 6′ of no. 121 were plotted (108). The cluster probably contains several giants (107, 158).

NGC 1817

In addition to the photographic data, the three faintest photoelectric standards were plotted (219). This is probably an old cluster but additional

photometry to at least $V = 16.0$ is necessary.

NGC 1893

All stars within 4′ of no. 115 were plotted (108).

NGC 1907

Average colours and magnitudes (108, 219) were plotted for all stars with $\Delta\mu \leq 2\sqrt{2}\sigma$ (162).

NGC 1912 (M38)

Stars with $\Delta\mu \leq 2\sqrt{2}\sigma$ were plotted. On the basis of spectral types (305) and proper motions the cluster contains several red giants.

NGC 1960 (M36)

Since it was not possible to eliminate stars on the basis of proper motions, all photometrically observed stars were plotted.

Trapezium

Average colours and magnitudes were plotted for stars in the immediate vicinity of θ' Ori.

NGC 2099

West's photometry was corrected (see NGC 2420) and average values were plotted from all three sources (38, 108, 294). Stars were considered members or possible members if $\Delta\mu \leq 2\sqrt{2}\sigma$ for two or three investigations (37, 143, 196).

NGC 2129

Only stars with 6′ of $x = -1, y = 2$ were plotted (108).

NGC 2158

Stars in the inner three rings were plotted (12). Proper motion data confirm the large cluster distance but cannot discriminate between cluster members and non-members (196).

NGC 2168 (M35)

Stars with $\Delta\mu \leq 2\sqrt{2}\,\sigma$ (162, 196, 251) or of membership classes 1, 2 and 3 (59) were plotted. At least one red giant—no. 101—is a probable cluster member.

NGC 2169

Only the photoelectric data were plotted because of inconsistencies in the photographic results.

NGC 2251

All stars within 6′ of $x = 0, y = 0$ were plotted (108).

NGC 2264

Stars with membership probability $p > 0.60$ and weight $w > 1$ were plotted. The bright variable S Mon is probably a member. None of the other suspected variables is common to the photometric and proper motion studies. Two of the five yellow giants have $p = 0.0$. This agrees with the radial velocity data which indicate that all five giants are non-members (272). There are several M stars in the region, none of which is listed as an Hα emission object (25).

NGC 2281

Average photoelectric measurements were plotted for stars with membership probability $p \geq 0.80$. Alcaino stars F(G8III), L(K2III), and Q(K0III) are probable red giant members (5).

NGC 2287 (M41)

Cox 21 is probably not a member and Cox 75 is a possible member based on radial velocities (49, 244). The cluster contains several red giants and supergiants.

NGC 2301

Average photoelectric colours and magnitudes from all three photometric sources (96, 108, 219) were plotted for stars with $\Delta\mu \leq 3\sigma$ (239). The photographic data do not agree well.

Cr 121

Only stars in the central region within 30′ of o^1 CMa were plotted. o^1 CMa is a member of the group (244).

NGC 2323 (M50)

All stars within 7′ of no. 176 were plotted (108).

NGC 2324

Average colours and magnitudes were plotted for stars within 3′ of no. 99 (18).

NGC 2353

Only stars inside a circle of radius 6′ around no. 175 were plotted (108).

NGC 2354

The colour-magnitude diagram contains stars within 7′ of no. 157 (54).

Cr 140

Star 2 (300) is not likely to be a member because of its very high proper motion and was not plotted.

NGC 2395

No stars fainter than the photoelectric limit were plotted. The distance is uncertain (45).

Mel 66

The colour-magnitude diagram was taken from an enlargement of the published diagram. Only those stars in region 1 were included (71). The distance modulus is 12.0 if Mel 66 is an old galactic cluster and 14.5 if it is a globular cluster like M13.

NGC 2422

All stars with $\Delta\mu \leq 2\sigma$ were plotted. The possible red giant members are all outside this limit in proper motion.

NGC 2420

West's (294) data were corrected to agree with that of Sarma and Walker (234). This correction was verified in the case of NGC 2099. All stars in rings 1 and 2 were plotted (294).

NGC 2423

No stars with $\Delta\mu > 3\sigma$ were plotted.

NGC 2437 (M46)

All stars with $\Delta\mu \leq 2\sqrt{2}\sigma$ were plotted.

NGC 2451

Only those stars considered members based on proper motions and radial velocities were plotted (301). The dynamical data were not given.

NGC 2467

Only those stars in a circle of radius 8′ around no. 57 were plotted (173).

NGC 2477

Since no data were available, the colour-magnitude diagram is taken from an enlargement of the original figure given by Eggen and Stoy. Proper motions were used to eliminate some stars (70).

NGC 2483

All stars no more than approximately 0.5 mag. fainter than the photoelectric limit and within 5′ of no. 1 were plotted (170).

NGC 2489

The colour-magnitude diagram contains stars within 3′ of the cluster centre (170) and no more than 0.5 mag. fainter than the limit of the photoelectric calibration.

NGC 2516

This cluster contains several late-type giants, three of which are Cox 21a(M0II), a(K1III), 110(M0III) (50, 73).

NGC 2533

All stars within 5′ of the cluster centre (167) and no more than 0.5 mag. fainter than the limit of the photoelectric sequence were plotted.

NGC 2539

Stars inside a circle of about 10′ radius were plotted (213). Several late-type giants–Pesch 21(K5I-II), 26(K0), and 61(M4III)–are probable members.

NGC 2547

Stars which were considered non-members from their proper motions were plotted.

NGC 2546

All stars in the region defined by Lindoff were plotted (168). The Cepheid AT Pup is not a cluster member (89). Average values were used for stars common to both photometric investigations (89, 168). Lindoff 99 (G8g:) and 356(Kg) are possible late giant members.

NGC 2548

Only stars with membership classes 1 and 2 were plotted. Several late-type giants are probable members–Pesch 8(G8:III), 12(G8), 15(K0III) and 28(F4) (213).

Pi 1

All stars within 1'.5 of a point halfway between stars 1 and 5 were plotted (168).

NGC 2567

The colour-magnitude diagram contains those stars within 4′ of a point halfway between stars 1 and 19 (167). There are several possible red giant members.

NGC 2571

Only stars within a circle of 4′ radius around a point 2 mm. N of no. 7 were plotted (167).

NGC 2579

The stars plotted are those within 4′ of a point 6 mm. NW of no. 5 and no more than 0.5 mag. fainter than the photoelectric calibration limit (168). This is a very poor cluster and probably only about half of the stars plotted are members.

Cr 185

All stars inside a circle of radius 4′ around a point 1 mm. E of no. 1 (168) were plotted.

NGC 2632 (Praesepe-M44)

Only physical members according to Klein-Wassink (147) and certain members according to Haffner (97) were plotted. The cluster contains four K0III stars and G0III giant (122).

IC 2391 (*o* Vel)

Proper motion members according to both investigations were plotted (109, 179). Lyngå 20 was plotted as a proper motion member but both radial velocity studies give it as a possible non-member (43, 78).

NGC 2670

All stars within 5′ of no. 11 were plotted (179).

Tr 10

Only proper motion members were plotted.

NGC 2682 (M67)

Stars with membership classes 1 and 2 (57) and *p* and *q* (203) were plotted. No. 1-1 (69) is considered a non-member from its radial velocity (214). No. 81 (B8) is a probable member (53, 183, 214, 288).

NGC 3114

Average values were plotted for stars within 12'.5 of no. 123 (119). Systematic errors were found in Lyngå's photographic photometry for $V > 10$ (179). The photoelectric values were satisfactory.

NGC 3228

Only proper motion members were plotted.

IC 2581

All stars within a radius of about 4' around no. 1 were plotted (171). The Cepheid UX Car is not a cluster member (89). The supergiant HD 90772 (F0Ia) is a cluster member (244). The specral type is A71a according to Lloyd Evans (171).

IC 2602 (θ Car)

All photoelectrically observed stars not eliminated from cluster membership by proper motion were plotted (30).

Tr15

Only stars within 1'.8 of a point 5 mm. SE of no. 8 were plotted (95). Grubissich defines non-members as those stars fainter than $V = 12$.

Tr 16 (η Car)

The colour-magnitude diagram contains those stars within 3' of a point 6 mm. SW of no. 16 (83). In the cluster region are several M-type stars some of which are probably giants (202).

An (Feinstein)a

Only stars in Feinstein's group *a* were plotted (80). Star no. 3(K0) could be a late supergiant.

NGC 3532

The colour-magnitude diagram contains those stars with $\Delta\mu \leq 2\sigma$. The Cepheid ER Car is not a member (89); neither is the supergiant X Car (G0Ia) (244).

NGC 3572

The photometry was corrected for zero point differences as found for Tr 18. Only stars in what was called 3572b by Schmidt and Santanilla were plotted (243). The supergiant y Car (F0Iap) is likely to be a cluster member based on proper motion and radial velocity (244). It was not studied photometrically and is not in the colour-magnitude diagram.

Tr 18

A zero point correction was applied to the photographic data (243) to bring them into agreement with the photoelectric values:

$V\text{pe} = V - 0.09$; $(B-V)\text{pe} = (B-V) + 0.17$.

All stars within a 6′ radius of a point 3 mm. S of no. 40 were plotted (243). The Cepheid GH Car is probably not a cluster member (89, 149).

NGC 3590

The photographic data were corrected as in the case of Tr 18. All stars inside a circle of radius 4′ around a point 2 mm. W of no. 7 were plotted (243).

NGC 3603

Only stars in the small central core of radius 0′.5 around a point 2 mm. N of no. 56 (249) were plotted.

NGC 3680

The colour-magnitude diagram contains those stars within 5′ of no. 34 (68).

NGC 3766

Systematic errors in $B-V$ and V among the three photometric papers were corrected and average values for stars common to all three papers were plotted (3, 154, 249). There are several M supergiants in the cluster region (27).

IC 2944

All stars observed two or more times were plotted.

NGC 4349

Only stars within 4′ of no. 85 were plotted (125). The Cepheids R Cru and T Cru are not cluster members (89, 149).

Mel 111 (Coma Berenices)

Average colours and magnitudes from the three photometric sources (9, 133, 189) were plotted for cluster members based on radial velocity and proper motion (271). Tr 60 is a δ Scuti variable (34) and Tr 160 is a variable star with a period of about one day (16). Tr. 125 at $V = 4.93, B-V = 0.26$ is a shell star (261).

NGC 4755 (κ Crucis)

Stars within 3′ of the cluster centre (14) except for radial velocity

non-members (76, 104) were plotted. Star D (M2-31ab) has a radial velocity that agrees with the cluster velocity but if it is a cluster member it is extremely luminous (76, 153).

NGC 5316

All stars within 7′ of a point halfway between no. 45 and no. 111 were plotted (222).

Lyngå 2

Only stars inside a circle of radius 4′ about a point 4 mm. S of no. 1 and no more than about 0.5 mag. fainter than the photoelectric limit were plotted (165).

NGC 5606

All stars within 1′ of no. 5 were plotted (180).

NGC 6517

The colour-magnitude diagram contains those stars within 4′ of no. 1 (165). The cluster probably contains several red giants although spectral data are inadequate.

Tr 22

This is a poorly defined cluster. Only stars within 4′ of a point 4 mm. SE of no. 1 and no more than 0.5 mag. fainter than the photoelectric calibration limit were plotted (166). The cluster may be physically related to Hogg 17.

Hogg 17

All stars within a radius of 4′ from no. 1 and brighter than $V = 14.75$ were plotted (166). This rather poor cluster may be physically connected with Tr 22.

Cr 285 (UMa cl)

Average colours and magnitudes from four photometric sources (64, 134, 197, 262) were plotted for fifteen stars in the nucleus of the cluster (64, 225). The distance modulus is based on the cluster parallax and proper motion (64).

NGC 5822

Although the photoelectric standards were in the *UBV* system, *R* plates were used in the photographic work instead of *V* plates. The data were given in the *UBV* system.

NGC 5823

As in NGC 5822 the photographic plates were in the *UBR* system. In the case of *B* plates many of the photoelectric standards fall outside the measurable area and there may be a systematic error of as much as 0.1 mag. in *B*. No. 27 (39) may be a variable star. The cluster is poor and only stars within 5′ of no. 71 were plotted (39).

NGC 6031

Only stars within 2′ of no. 1 and brighter than $V = 15.5$ were plotted (164).

NGC 6067

All stars inside a circle of radius 4′ around a point 4 mm. SE of no. 136 and not excluded on the basis of radial velocity were plotted (264). The cluster contains several red giants.

NGC 6087

The Cepheid S Nor is probably a cluster member from its photometric data and radial velocity (74, 88, 144, 149, 256) but membership from proper motion is less certain (156). Photometric data from three sources were averaged and plotted (33, 88, 156). The colour and magnitude for S Nor are based on data from several sources (88, 117, 199).

NGC 6124

All stars inside a circle of radius 3′ around no. III-1 were plotted (268).

NGC 6193

The distance modulus and reddening are spectroscopically determined average values for the eighteen stars observed.

NGC 6204

There appear to be two stellar groups in the region. Only stars in the NW group within about 1′ of no. 40 were plotted (296). Whiteoak's values of $(m-M)_O = 12$, $E_{B-V} = 0.7$ were based almost exclusively on stars in the SE group. No distance and reddening are quoted for this group but values of $(m-M)_O \cong 9$ and $E_{B-V} \cong 0.4$ are indicated.

NGC 6231

Stars with $\Delta\mu \leq 2\sqrt{2}\sigma$ were plotted (32, 246). Three stars (HD 151397, HD 152408, 72 Col) are high velocity stars in the region which may be runaway stars from the cluster. The evidence is inconclusive (24).

NGC 6322

All stars brighter than $V = 14.0$ were plotted (176).

NGC 6383

The colour-magnitude diagram contains those stars within 10′ of no. 1 (267). There are some possible late-type giants outside this region but insufficient data are available to determine membership. The M_V and $(B-V)_0$ shown on the diagram are based on $E_{B-V} = 0.30$ and $(m-M)_0 = 10.5$ as given by The. Just before completion of the manuscript photometric, spectroscopic and radial velocity data were received from Lloyd Evans (172) and the quoted reddening and distance modulus are based on an average of the two determinations. The change in distance and reddening implied by these data is quite small.

NGC 6405 (M6)

Average colours and magnitudes for stars within 11′ of no. 71 were plotted. There seem to be systematic differences between the data by Rohlfs, Schrick, and Stock (232) and those by Talbert (263) and Eggen (62).

IC 4665

Photometric averages (4, 111, 124) were plotted from probable and possible members (274). Some stars were eliminated on the basis of radial velocity (2). The distance modulus $[(m-M)_0 = 8.6]$ by Hogg and Kron (111) was not used.

NGC 6475 (M7)

Data by Koelbloed (148) were corrected to agree with Hoag et al. (108) and average values for stars within 13′ of no. 26 (148) were plotted. Koelbloed 58(K0111) is probably a cluster member (78).

NGC 6494

All stars within a radius of 6′ around no. 110 are plotted (108).

NGC 6530

The existence of T Tauri stars in the cluster is open to question (26, 266, 282).

NGC 6531 (M21)

Only stars inside a circle of radius 2′.5 around no. 123 are plotted (108).

NGC 6611 (M16)

Photoelectric averages (108, 285) were plotted for stars with $\Delta\mu \leq 3\sigma$

(238). Much of the scatter in the diagram is probably due to differential reddening in the cluster. There may be a few late-type giants in the cluster (285) but the M stars in the region are probably foreground objects (25).

NGC 6633

Only stars with membership probability $p \geq 0.70$ were plotted (276). Three of the five red giants in the region are proper motion members and the other two, although not in the proper motion survey, are probably also members.

IC 4725 (M25)

The Cepheid U Sgr is a cluster member (74, 144, 156, 256). The colour and magnitude plotted are based on several sources (117, 130, 199, 201, 230, 292). The two M giants in the cluster region are not members (289).

NGC 6649

Only photoelectric averages for stars within 5′ of a point 2 mm. S of no. 9 were plotted (51, 269). No. 64 may be a Cepheid variable and cluster member (228).

NGC 6664

The Cepheid EV Sct is a cluster member (149, 150). The colour and magnitude plotted are from two sources (10, 199).

IC 4756

All stars within 15′ of no. 28 were plotted (4). The supergiant HR 172365 (F0Ib) lies in the cluster region but its membership is uncertain (244).

Tr 35

Average values for stars within 3′ of no. 111 were plotted (108, 304).

NGC 6694 (M26)

Only stars within 3′ of $x = -2, y = +1$ were plotted (108).

NGC 6705 (M11)

Proper motion data were used to eliminate probable non-members (37, 190).

An (Stephenson) (δ Lyr)

All stars inside a circle of radius 5′ around no. 3313 were plotted (65). The reality of the cluster has been argued (35, 255).

NGC 6755

Only stars within 8′ of $x = 0$, $y = 0$ are plotted (108). The distance modulus and reddening are uncertain and more data are necessary for an adequate determination (132, 259).

NGC 6791

The colour-magnitude diagram contains those stars within 1′ of no. 20 NW (146). Star 30 NE was considered a non-member from its radial velocity.

NGC 6802

Only stars inside a circle of radius 3′ around no. 122 were plotted (108).

NGC 6819

All stars within 4′ centred on a point 3 mm. NW of no. 14 were plotted (108).

NGC 6823

Average photoelectric values were plotted for stars within 3′ of no. 42 (108). There was substantial disagreement between the photographic data.

NGC 6834

Only stars within 2′ of a point 3 mm. SW of no. 54 were plotted (92). Data are average values from both sources (92, 108).

NGC 6866

All stars inside a circle of radius 3′.5 around $x = -1.5$, $y = +1.5$ are plotted (108).

NGC 6882

This cluster is probably at the centre of an association, NGC 6885 (132, 162, 192, 235, 259). Only stars within 3′ of no. 73 were plotted (108). No. 15 (K2III) is a probable giant member (259).

IC 4996

All stars with $\Delta\mu \leq 2\sigma$ were plotted. Only proper motion data by van Schewick (239) were used since the quoted errors by Hopmann and Haidrich (113) were considerably larger.

NGC 6910

Only those stars within 5′ of no. 101 were plotted (108). The supergiants HD 194093 (F8Ib) and HD 194069 (G2II) are not cluster members (244).

NGC 6913 (M29)

The colour-magnitude diagram contains those stars within 3'.5 of no. 103 (108).

NGC 6939

The proper motion investigation (191) had virtually no stars in common with the photometry (46). Therefore all stars brighter than $V = 14.8$ were plotted.

NGC 6940

Stars considered proper motion cluster members were plotted (277). This cluster is particularly interesting because of the nature of the giant branch (196, 283).

NGC 7031

All stars within 3'.5 of $x = -1.5, y = +1$ were plotted (108). Star no. 1 (G8III) is not likely to be a cluster member (259).

NGC 7062

Average colours and magnitudes were plotted for stars within 7' of no. 35 (85). Fenkart's photographic values had to be corrected to agree with those in Hoag et. al. (85, 108).

NGC 7063

No stars were plotted fainter than $V = 15.0$ because of an apparent scale error (108). This cluster may contain several late-type giants but no spectroscopic data are available.

NGC 7067

Average values for stars within 2' of no. 15 were plotted (21, 108).

NGC 7086

Only stars inside a circle of radius 5' around no. 57 were plotted (100, 108).

NGC 7092 (M39)

All stars with membership criteria $\leq 2\sqrt{2}\sigma$ were plotted (58, 61, 162, 237).

NGC 7128

Only stars inside a circle of radius 2' around $x = 0.5, y = 1.5$ were plotted (108).

IC 5146

Four late M stars appear in the cluster region and could be members (25).

NGC 7160

All stars within 7′ of $x = 0, y = 1$ were plotted (108).

NGC 7209

Stars with $\Delta\mu \leq 3\sigma$ for all three sources or $\Delta\mu \leq 2\sigma$ for one or two papers were plotted (15, 161, 240). The supergiant no. 102 (K5Ib) is a non-member from proper motion and no.'s 103 (K4III) and 105 (G8III) are probable members.

NGC 7235

Average colours and magnitudes were plotted for stars inside a circle of radius 2′ around no. 71 (19, 108).

NGC 7380

Only stars within 5′.5 of a centre at $x = -1.5, y = +1$ were plotted (108).

NGC 7510

The colour-magnitude diagram contains those stars within 2′.5 of no. 122 (108).

NGC 7654 (M52)

Photoelectric data (211) were plotted for proper motion members–i.e. $\Delta\mu \leq 2\sqrt{2}\sigma$ (60, 177, 236) BD + 60° 2532 (F7Ib) is probably a cluster member (153, 244).

NGC 7788

All stars inside a circle of radius 3′ around no. 8 were plotted (20).

NGC 7789

Proper motion data were used to exclude stars from the colour-magnitude diagram (195). The spectral type of the reddest star in the giant branch is debatable (42, 186, 287).

NGC 7790

The Cepheid CF Cas is a cluster member (149, 150) as are almost certainly CEa Cas and CEb Cas. The data for CF Cas are from two sources (199, 229). Those for CEa Cas and CEb Cas are from J. Smak (1966, *Acta Astr.* **16**, no. 1).

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